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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,605	07/30/2002	Ronald Scott Bunker	124626-1	6850

6147 7590 11/14/2003

GENERAL ELECTRIC COMPANY
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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 11/14/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

2205

Office Action Summary	Application No. 10/064,605	Applicant(s) BUNKER, RONALD SCOTT	
	Examiner Raymond Alejandro	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/30/02 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 08/06/02 (paper # 4) was considered by the examiner.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "130" has been used to designate both the top channel and the bottom channel. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 90 and 185. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "140" has been used to designate both the bottom channel and the concavities. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

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5. The drawings are objected to under 37 CFR 1.83(a) because they fail to show the “*concavities 260*” as described in the specification, in particular, *it is noted that paragraphs 0016 and 0017 make reference to the concavities 260 by directing attention to Figure 1.* Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Margiott 2002/0086200.

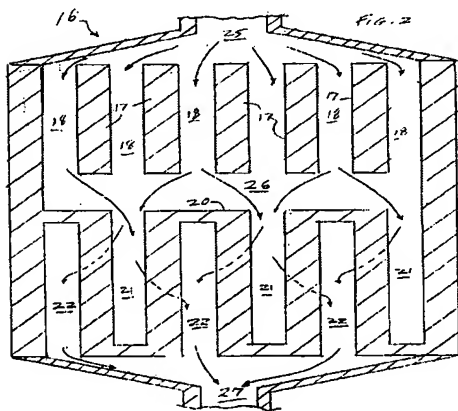
The present application is directed to an apparatus for fuel cell components wherein the disclosed inventive concept comprises the specific flow field plate structural arrangement. In addition, other limitations include the fuel cell components; the plurality of concavities and their shape; the flowing fluid; the upper-bottom ribs disposing angle; and the fuel cell per se and the specific fuel cell.

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With respect to claims 1 and 7:

Margiott teaches a fuel cell with a reactant flow field plate comprising an inlet and an outlet; a plurality of flow-through flow field channels; a plurality of interdigitated flow field channels; and a flow transition for directing flow between said flow-through channels and said interdigitated channels, said channels and said transition extending between the inlet and the outlet (CLAIM 1).

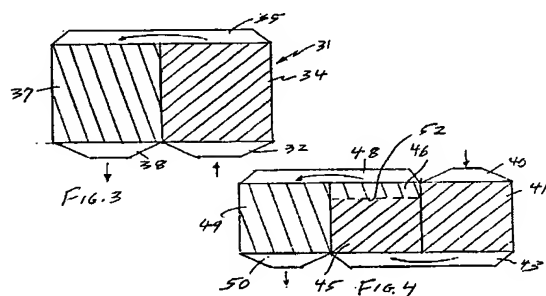
Figure 2 below depict the flow field plate comprising a base plate; and first and second side plate structurally connected to the ends of the base plate. The base plate includes ribs 17 defining flow-through flow field channels 18, and a serpentine rib 20 that defines inlet channels 21 and outlet channels 22 (SECTION 0013). It is also disclosed that the hybrid flow channels may be implemented in a flow field which folded one or more times (SECTION 0006). *Thus, if the channels are folded, the resulting plate structure will have channels laying one over another.*



It is also disclosed that the hybrid flow channels may be implemented in a flow field which folded one or more times (SECTION 0006). *Thus, if the channels are folded, the resulting plate structure will have channels laying one over another.*

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Figures 3-4 below illustrate the flow field plate in a folded configuration in which the oxidant enters through an inlet manifold 32, passes through a portion 34 of the plate having channels, then is turned by a flow reversing manifold 35 so as to flow through a portion 37 of the plate 31 which also has channels (SECTION 0014). In particular, Figure 4 shows the transition between the portions 34 and 37 not at the manifold 35 but mid-way between the manifold 35 and either of the manifolds 32 or 38 (SECTION 0014).



depending upon other parameters. In FIG. 3, a fuel cell reactant flow field plate 31 is shown in a folded configuration in which the oxidant enters through an inlet manifold 32, passes through a portion 34 of the plate 31 which has flow-through reactant flow field channels, then is turned by a flow reversing manifold 35 so as to flow through a portion 37 of the plate 31 which has interdigitated reactant flow field channels, after which the reactant flows through an exit manifold 38 to exhaust. However, the transition between the portions 34 and 37 need not occur at the manifold 35, but may be mid-way between the manifold 35 and either of the manifolds 32, 38, as is illustrated in FIG. 4. Therein, the reactant flows through an inlet manifold 40, through a first portion 41 which comprises flow-through reactant flow field channels, through a reversing manifold 43 and a second portion 45 which has flow-through reactant flow field channels, and thence through a portion 46 which has interdigitated reactant flow field channels, through a reversing manifold 48 and a portion 49 which has interdigitated flow field channels, and thence through an exit manifold 50 to exhaust. The transition 52 between the flow-through channels and the interdigitated channels may be located anywhere between the manifolds to suit any utilization of the present invention.

Hence, Margiott's flow field plate comprises a plurality of upper ribs and a plurality of bottom ribs forming top channels and bottom channels in the flow field plate per se to allow a flow of fluid to alternate between the top channels and the bottom channels.

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With respect to claims 2 and 9:

Margiott teaches the fuel cell components anode, the cathode and the electrolyte (SECTION 0002).

With respect to claims 3-4 and 10-12:

Margiott also discloses a plurality of ribs 17 that project from the flow field plate and form recesses or indentations on the plate surface (SECTION 0013/ FIGURE 2). *Therefore, the ribs themselves also act as the claimed concavities.*

With respect to claims 5 and 13:

Margiott additionally teaches the reactants being hydrogen or a hydrogen-rich fuel and an oxygen or air oxidant (SECTION 0002).

With respect to claims 6 and 14:

Figures 3-4 above illustrate flow fluid plates in folded configurations wherein the flow reversing manifold or the transition between the plate portions and the flow-through flow field channels and the interdigitated flow field channels are disposed at the angle of substantially 90 degrees to provide the turns or reversing manifolds.

As to claim 8:

Margiott teaches alkaline, acid or solid polymer electrolyte fuel cells (SECTION 0002).

Consequently, the claims are anticipated.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Raymond Alejandro
Examiner
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A handwritten signature in black ink, appearing to be 'RAM', with a long horizontal stroke underneath.